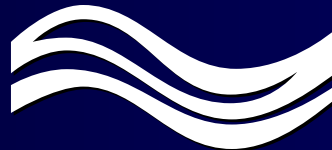


# **State Water Resources Control Board's On-Site Wastewater Treatment Systems Regulations**

## **State Water Board Workshop Information Item**

**December, 9, 2005  
Sacramento California**



**Water Boards**

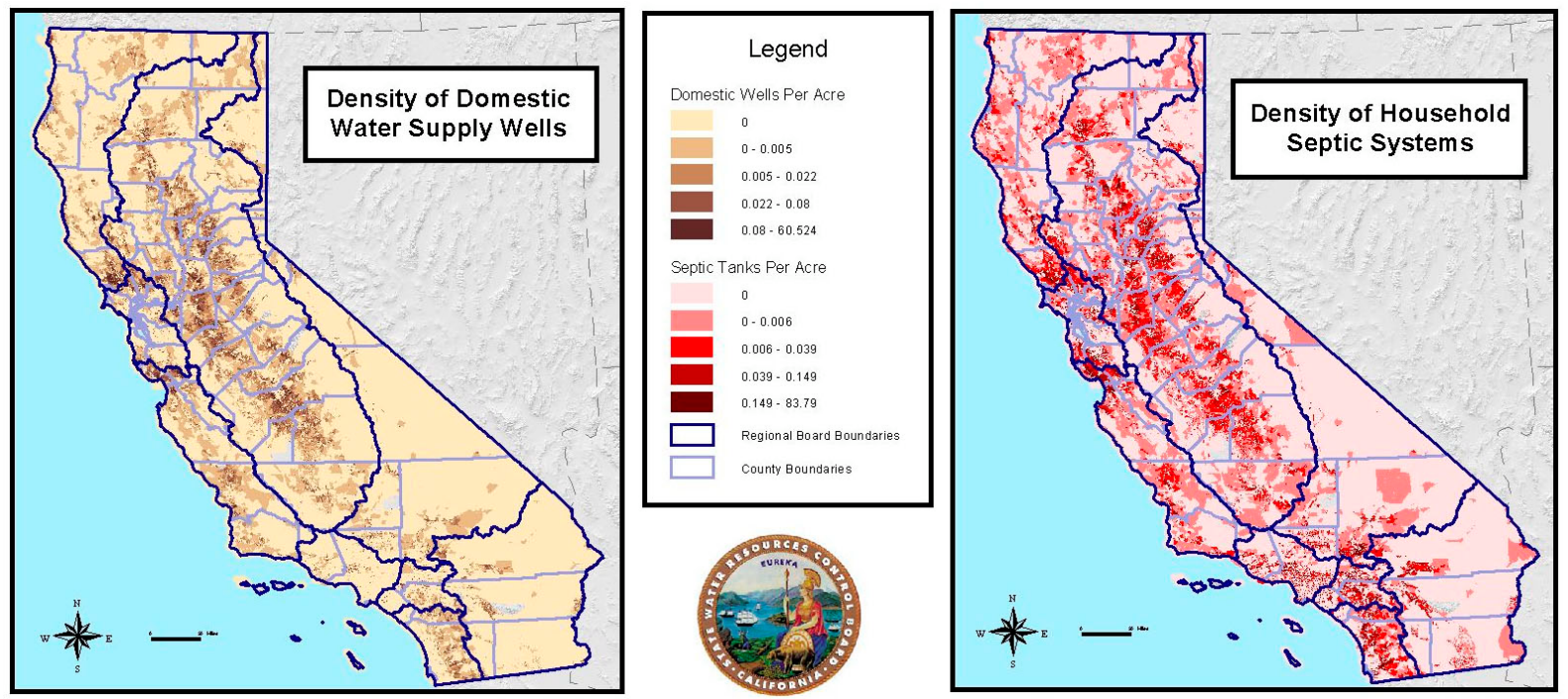
# **SLIDES**

- **Where are the OWTS?**
- **Elephant in the Room**
- **State-of-the-Art OWTS**
- **A Brief History**
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- **Summary**
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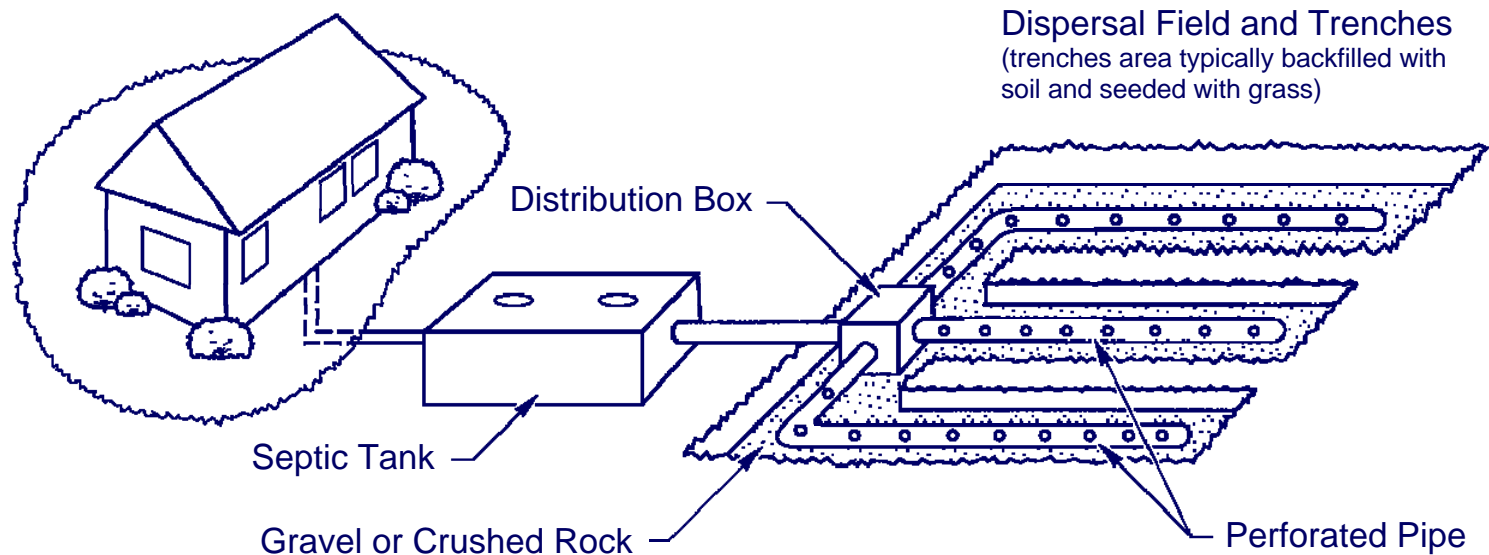
# Where are the OWRs?

## Densities of Domestic Supply Water Wells and Household Septic Systems Based on 1990 United States Census Data



# OWTS: Conventional Systems

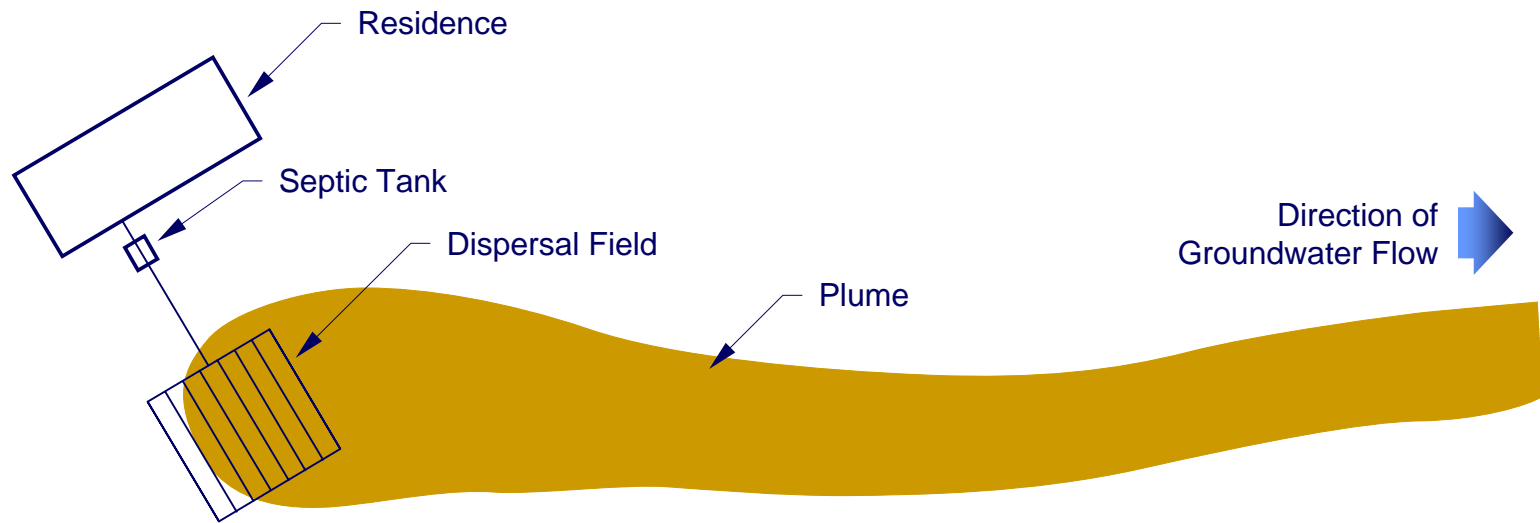
## Typical Conventional System



- Over 90% of the state's OWTS are conventional systems
- Solids settle in septic tank and effluent is discharged into dispersal field
- Effluent contains such pollutants as bacteria and viruses, and dissolved organic and inorganic compounds, including nitrates and pharmaceutical products
- Cost \$5,000 to \$15,000

# OWTS Discharge Plume in Groundwater

Source: USEPA OWTS Manual 2002



- Pathogen survival time in unsaturated soil is up to 100 days but usually less than 20 days
- Dissolved organic compounds and pharmaceuticals resistant to degradation and inorganic compounds including nitrates **eventually reach groundwater**
- In groundwater, OWTS discharge plumes can remain intact for hundreds of feet
- Plume water quality can exceed drinking water standards for nitrates for hundreds of feet

## "State-of-the-Art" OWTS

A state-of-the-art OWTS distributes treated effluent with a low BOD/SS concentration to a **shallow** low-application-rate dispersal system. Aerobic and anaerobic soil organisms substantially reduce residual compounds, including nitrogen. Such an OWTS would include:

- Septic tank with effluent filter
- Supplemental treatment unit that reliably reduces BOD, SS and total nitrogen
- Shallow dispersal of effluent into soil with ground cover
- Maintenance contract with telemetry monitoring

Cost: ~ \$25,000 - \$40,000

# Brief History: OWS Regulations

## **2000**

AB 885 requirement that State Water Board adopt regulations or standards by January 2004

## **2000-2002**

Facilitated stakeholder meetings

## **2003-2004**

Stakeholder review of draft regulations, revised draft regulations, and revised revised draft regulations

## **2005**

CEQA public meetings on revised revised draft regulations

## **2005**

State Water Board workshop on December 9

# Summary of June 2005 Version of Draft OWTS Regulations

- **Memorandum of Understanding:** Local agencies “implement” regulations based on MOUs with Regional Water Boards
- **OWTS Design/Performance Standards:**
  - Conventional OWTS: Five-foot minimum depth to groundwater or impervious layer and application rates for dispersal areas.
  - Supplemental treatment systems: Minimum treatment requirements and two-foot depth to groundwater/impervious layer
- **Monitoring:** Inspection of septic tanks for solids and groundwater monitoring *at point of sale*.
- **Impaired Surface Water:** Where OWTS contribute to impairment:
  - January 2007 - Supplemental treatment for new OWTS within 600 ft
  - January 2009 - Supplemental treatment for existing OWTS within 600 ft (2015 if a TMDL has been approved by January 2009).
  - A study may be conducted to demonstrate whether 600 ft is appropriate for a specific water body.



# CEQA Public Meetings: Major Comments

1. **Design Standards:** Too restrictive - they will make OWTS too expensive or lots unbuildable
2. **Monitoring**
  - Septic tank inspections and groundwater monitoring at point of sale will disrupt real estate transactions
  - Domestic well sampling cannot be directly tied to OWTS
3. **Impaired Surface Waters:** Requirements for OWTS adjacent to impaired surface waters are restrictive and costly
4. **Costs:** Costs to local agencies to implement draft regulations are too high

## Design Standards: Background

- Five-foot minimum depth-to-groundwater/impervious layer for conventional OWTS could make many lots unbuildable, or require expensive supplemental treatment.
- Normal operation of OWTS “results in retention and die-off of most, if not all, observed pathogenic bacterial “indicators” within 2-3 feet.” Significant virus removal occurs in 2-3 feet. *USEPA OWTS Manual*
- Supplemental treatment reduces bacterial populations prior to dispersal.
- Most county ordinances and Water Boards’ basin plans include a minimum depth in the 3-5 foot range.
- Dissolved organics/inorganics eventually reach groundwater. *USEPA OWTS Manual*

# Design Standards: Minimum Depth to Groundwater/Impervious Layer

## Options

- No minimum depth specification **(CCDEH)**
- 5-foot minimum (June 2005 draft)
- A range of 3-5 feet for conventional OWTS and a range of 2-3 feet for OWTS with supplemental treatment **(DWQ 1)**
- A range of 2-5 feet with a matrix of specific criteria based on soil type, parcel size, treatment **(DWQ 2)**

## Note:

- County/basin plan requirements may be more restrictive
- Other recalcitrant constituents of concern are usually not removed/reduced with depth (e.g., nitrates)

# Monitoring Requirements

## Comments:

- Septic tank inspections and groundwater monitoring at point of sale will disrupt real estate transactions and will collect data haphazardly
- Domestic well sampling cannot be directly tied to OWTS



# Monitoring: Septic Tank Inspections

## Background:

Septic tanks should be pumped every 3-5 years  
unless inspected for solids levels (USEPA OWTS Manual)

Costs ~ \$50 - \$100 per inspection

## Options:

- No septic tank inspections **(CCDEH)**
- Septic tank inspections at sale of property (June 2005 draft)
- Septic tank inspection every 5 years for all OWTS **(DWQ)**

# Monitoring: Groundwater

## Background:

The draft regulations required monitoring groundwater in the vicinity of the OWTS discharge because:

- OWTS plumes impair water quality and travel for hundreds of feet
- The standard setback for domestic wells from an OWTS is 100 feet  
(There are ~1,200,000 OWTS and ~600,000 domestic wells)
- State law requires monitoring as a condition of any waiver of waste discharge requirements

# Monitoring: Groundwater

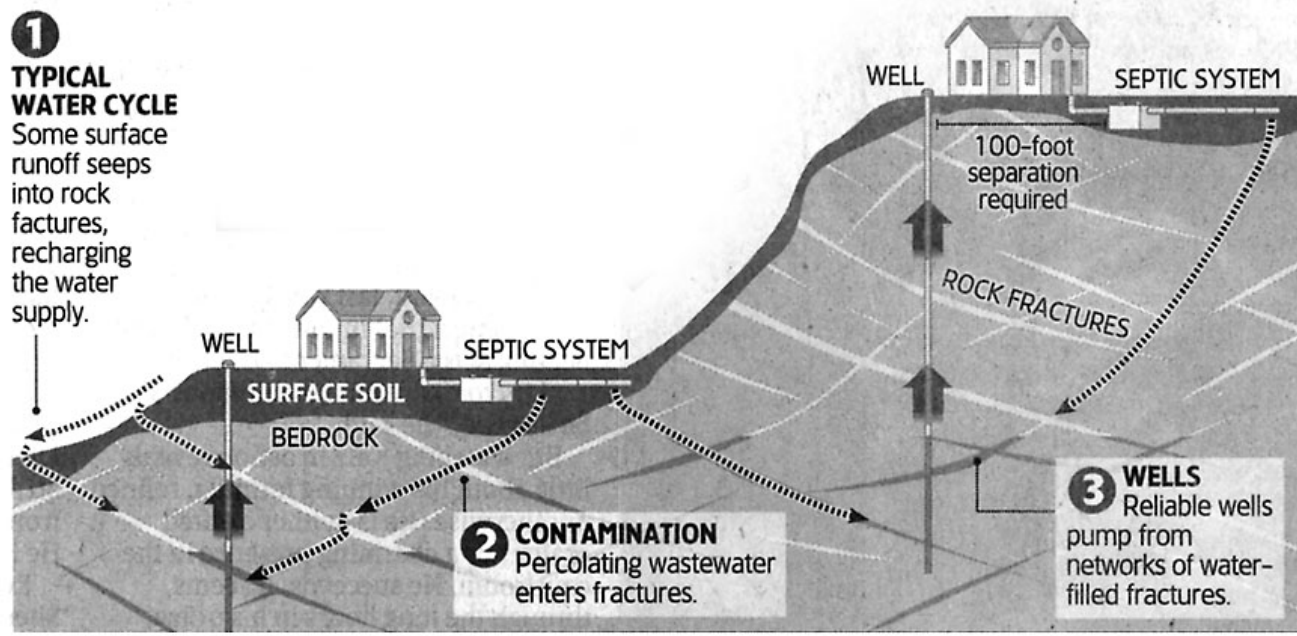
## Background Cont'd:

Groundwater monitoring downgradient of the OWTS discharge would require:

- Determine direction of groundwater flow - typically with three monitoring wells
- Install a monitoring well(s) downgradient of the OWTS discharge
  - Total cost for four wells ~ \$6,000 - \$18,000
  - Sample/analysis costs ~ \$150 - \$350

**Note:** Groundwater monitoring of the OWTS discharge in a fractured rock environment is problematic

# OWTS Effluent in a Fractured Rock Environment



- Common shallow soil environment of foothills and rolling terrain
- OWTS discharge travels through erratic fissures in underlying rock; path is impossible to predict
- OWTS discharge in such environments travels faster and may be less diluted



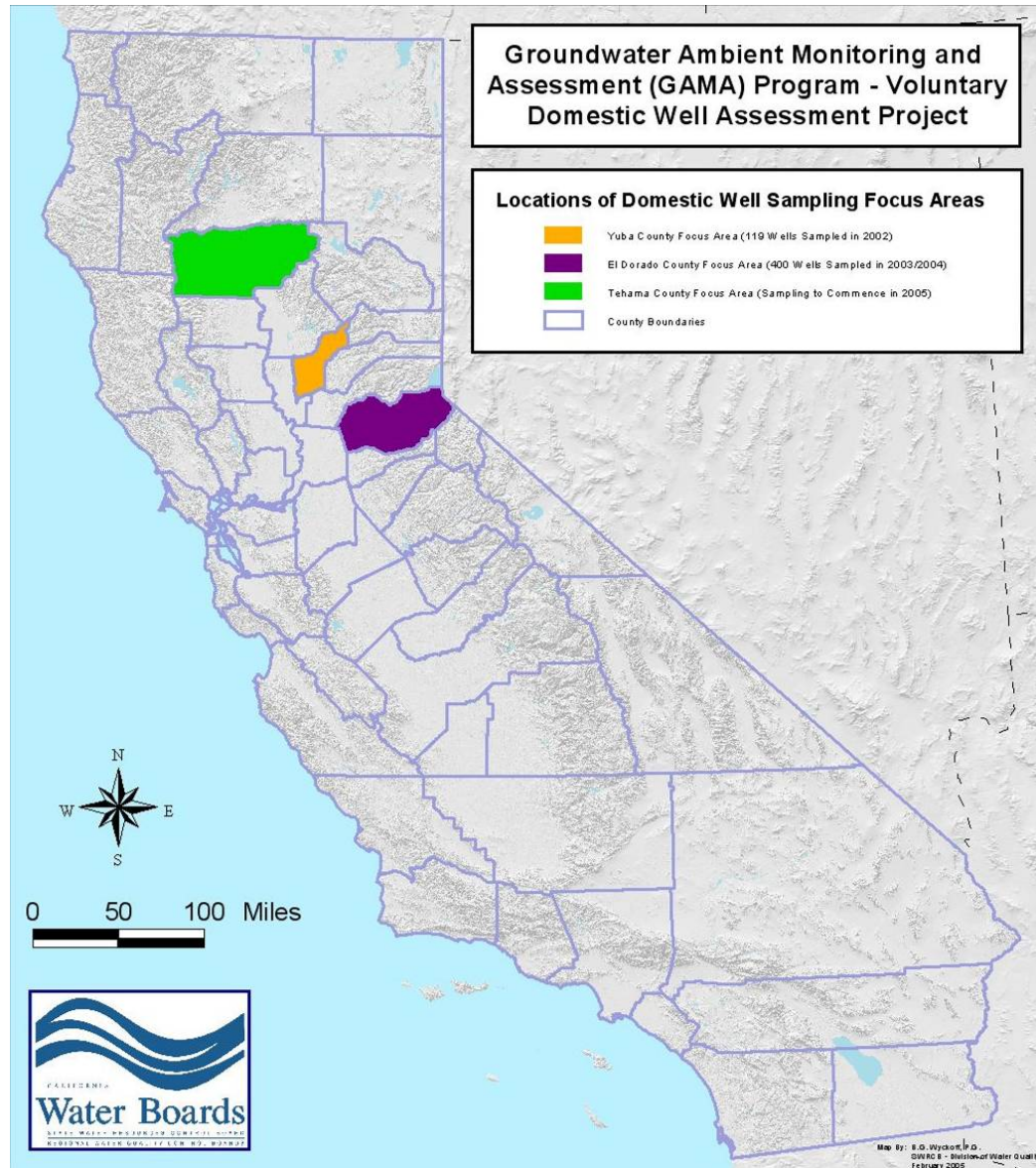
## Monitoring: Domestic Wells

Domestic well monitoring was allowed as an alternative to downgradient monitoring of the OWTS discharge because:

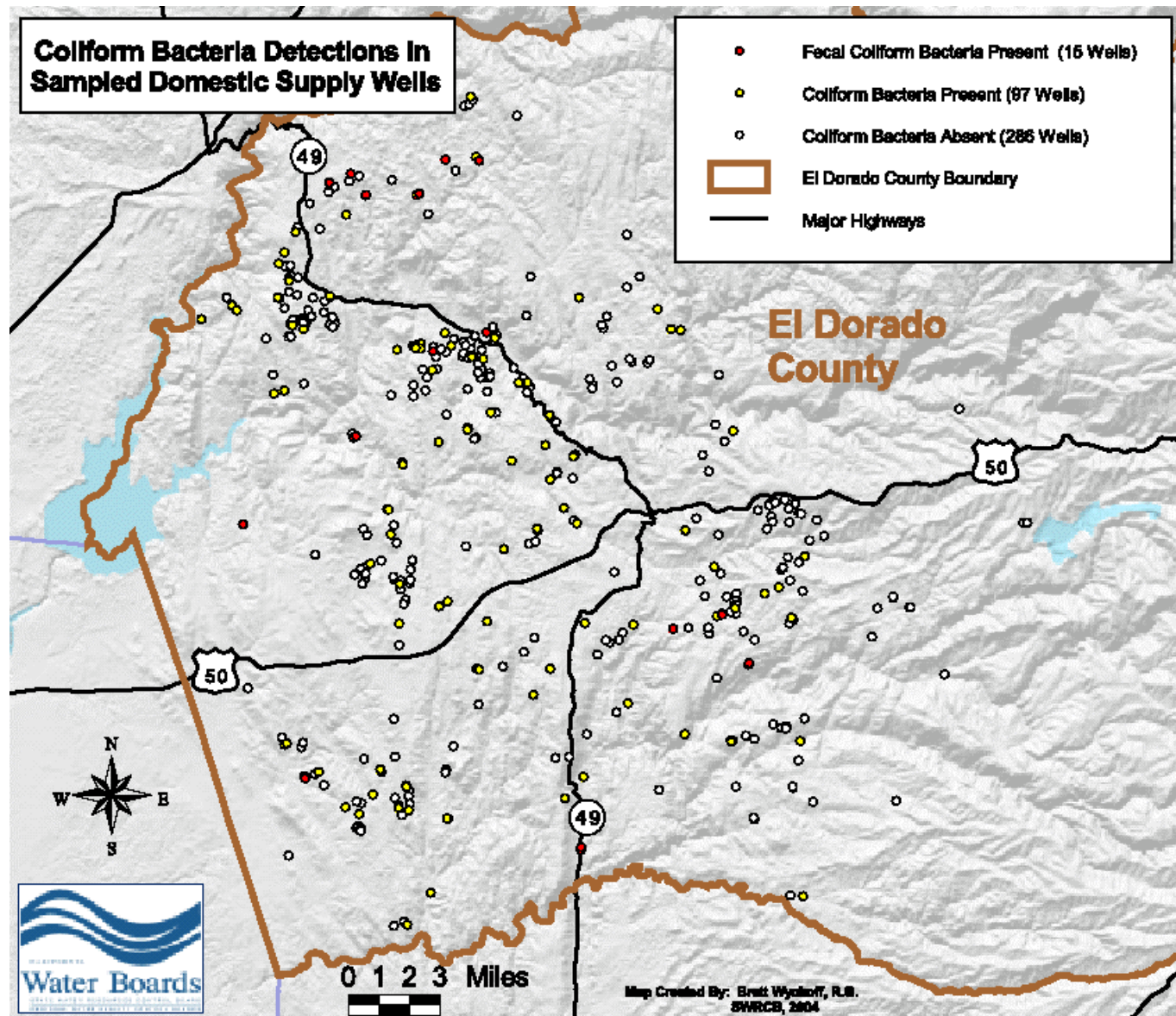
- No new monitoring wells required
- Sample/analysis costs ~ \$150 – \$350
- Domestic wells monitor groundwater quality in the vicinity of OWTS discharges and other contaminating activities
- Information of value to well owner
- Domestic well data allows Water Boards to conduct a survey level assessment of groundwater quality in vicinity of OWTS discharges
- Local agencies can access data

**Note:** “It is recommended that (domestic well) water be tested **every year** for total coliform bacteria, nitrates, total dissolved solids, and pH levels. If you suspect other contaminants, test for those.” USEPA

# Groundwater Ambient Monitoring and Assessment Program: Areas Monitored



# Groundwater Monitoring Data: Bacteria Results in El Dorado County





# Monitoring: Groundwater

## Options for groundwater monitoring where domestic wells are nearby:

- No groundwater monitoring **(CCDEH)**
- Require groundwater monitoring\* at new OWTS installations and all OWTS at point of sale (June 2005 draft)
- Require groundwater monitoring\* at new OWTS installations and all OWTS every 3-5 years **(DWQ)**

\*Allowing domestic well monitoring as an alternative to downgradient monitoring of the OWTS discharge

# Impaired Surface Waters (303d Listed)

## Background:

AB 885 mandated requirements for OWTS adjacent to impaired surface waters identified pursuant to Section 303(d) of the Clean Water Act.

## Options:

- Keep requirements in draft regulations where OWTS contribute to impairment. (DWQ)
- For an OWTS-impaired water body listed as of the effective date of the Regulations, a Regional Water Board and local agency shall develop a program to improve water quality within 24 months and implement the program no later than 48 months. (CCDEH)

# Costs to Local Agencies Too High

## Background:

- Local agencies have existing and detailed ordinances for permitting, design and construction of OWTS
- The draft regulations provided for MOUs between local agencies and Water Boards to implement regulations
- The MOU requirements included extensive record-keeping and reporting on new and repaired OWTS

**Note:** Local agency ordinances should already comply with basin plan requirements

# Costs to Local Agencies Too High

## Options to address costs to local agencies:

- Retain MOU requirements (June 2005 draft)
- Minimize MOU requirements **(CCDEH)**
- Authorize local agencies to implement regulations upon request to State Water Board (without an MOU and its reporting requirements) **(DWQ)**

**Notes:** The proposed DWQ revisions would make the draft regulations self-implementing, requiring action only by OWTS owners

# Implementation: Conditional Waiver

## Background:

Any person discharging waste that could affect the quality of the waters of the state shall file a report of the discharge. The State or Regional Water Boards may waive waste discharge requirements as to a type of discharge (e.g., OWTS) if the waiver is consistent with basin plans and is in the public interest.

The conditions of the waiver shall include the performance of individual, group or watershed monitoring *unless the Water Boards determine that the discharge(s) do not pose a significant threat to water quality.*





# Implementation: Conditional Waiver

## Background cont'd

Do OWTS discharges affect the quality of the waters of the state? **Yes**

Do OWTS discharges pose a significant threat to water quality? **Yes**

- OWTS discharge plumes and flow in fractured rock exceed water quality objectives and, in the vicinity of domestic wells, pose a significant threat to water quality and its beneficial use.

# Implementation: Conditional Waiver

## Options:

- Each Regional Water Board issues waste discharge requirements for individual OWTS discharges (bad idea)
- Each Regional Water Board adopts a conditional waiver for OWTS discharges
- State Water Board adopts a statewide conditional waiver for OWTS discharges **(DWQ)**

# Summary of DWQ Staff Recommended Revisions to Draft Regulations

## Design Standards (minimum depth to groundwater):

- A range of 3-5 feet for conventional OWTS and a range of 2-3 feet for OWTS with supplemental treatment; or
- A range of 2-5 feet with a matrix of specific criteria based on soil type, parcel size, treatment

## Monitoring:

- Septic tank inspections for all OWTS every 5 years
- Groundwater (or domestic well) monitoring at new OWTS installations and all OWTS every 3-5 years

## Costs:

- Authorize local agencies to implement regulations upon request

## Implementation:

- Adopt regulations and statewide waiver

# Timeline for Adoption of Regulations and a Statewide Conditional Waiver

## **December - March 2006**

Draft revisions to regulations, statement of reasons, environmental impact report and statewide conditional waiver

## **April 2006**

Notice draft regulations, draft EIR, and draft waiver for public review and hearing

## **June - August 2006**

Prepare response to comments and make revisions to draft regulations, draft EIR, and draft waiver

## **September 2006**

Re-notice revisions

## **October 2006**

Adopt final regulations, final EIR, and final waiver